

U.S. Patent Application Serial No. 09/895,331
Amendment dated November 3, 2003
Reply to OA of August 1, 2003

IN THE CLAIMS:

Please cancel claim 3 without prejudice or disclaimer and amend claim 1 as follows:

1. (Currently Amended): An aqueous dry laminate adhesive composition for artificial leather comprising:

a water-borne polyurethane resin (A), a crosslinking agent (B), and a thickener (C),

wherein said water-borne polyurethane resin (A) has a softening temperature of less than 50°C and a viscosity of the melt at 50 °C of less than 10^5 Pa·s, and

wherein a softening temperature of a cured product obtained after curing a reaction product between said water-borne polyurethane resin (A) and the crosslinking agent (B) is higher than 120°C, said crosslinking agent (B) is a polyisocyanate crosslinking agent, and said thickener (C) is a surface active agent in the system of an association-type polymer, and

wherein said water-borne polyurethane resin (A) is a polyurethane resin obtained by one of:

(1) a method comprising the steps of preparing an organic solvent solution of a polyurethane resin containing carboxyl groups, by reacting a compound containing active hydrogen atoms and a compound containing carboxyl groups with polyisocyanate, and then optionally adding a nonionic emulsifier and a neutralizer to the organic solvent solution or an organic solvents dispersion and obtaining an aqueous dispersion of the water-borne polyurethane resin by mixing the above-described solution containing additives with water,

(2) a method comprising the steps of preparing a polyurethane prepolymer containing carboxyl groups and containing isocyanate groups at the terminal ends of the prepolymer, by reacting

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a compound containing active hydrogen atoms and a compound containing carboxyl groups with isocyanate, optionally mixing the prepolymer with an aqueous solution containing a nonionic emulsifier and a neutralizer or adding a neutralizer in advance to the urethane prepolymer, dispersing the urethane prepolymer in the aqueous solution containing a nonionic emulsifier, and obtaining an aqueous dispersion by reacting polyamine with polyisocyanate groups including the prepolymer,

(3) a method comprising the steps of preparing a polyurethane resin containing hydrophilic groups by reaction of a compound containing active hydrogen atoms and a compound containing carboxyl groups with isocyanate, preparing an organic solvent solution or an organic solvent dispersion of the polyurethane resin, and obtaining an aqueous dispersion by optionally mixing the above organic solution and water with an addition of a neutralizer,

(4) a method comprising the steps of preparing a polyurethane prepolymer containing carboxyl groups and isocyanate groups at the terminal ends of a prepolymer, by reacting a compound containing active hydrogen atoms and a compound containing carboxyl groups with isocyanate, mixing the prepolymer with an aqueous solution containing a neutralizer, or adding a neutralizer to the prepolymer, and mixing with water, and further adding a polyamine for obtaining an aqueous dispersion, and

(5) a method comprising the steps of preparing a polyurethane prepolymer containing carboxyl groups and containing isocyanate groups at terminal ends of the prepolymer, by reacting a compound containing active hydrogen atoms and a compound containing carboxyl groups with isocyanate, mixing with an aqueous solution containing a neutralizer and polyamine, or adding a

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neutralizer to the prepolymer beforehand, and mixing with an aqueous solution containing polyamine for obtaining an aqueous dispersion.

2. (Previously Presented): An aqueous dry laminate adhesive composition for artificial leather according to claim 1, wherein said water-borne polyurethane resin(A) has a weight-average molecular weight ranging from 2,000 to 200,000 and has at least two active hydrogen atom-containing groups, which are reactive with isocyanate groups.

3-4. (Canceled)

5. (Previously Presented): An aqueous dry laminate adhesive composition for artificial leather according to claim 1, wherein said aqueous dry laminate adhesive composition further comprises aqueous dispersible colorants which are obtained by coating surfaces of pigment particles with an aqueous dispersible resin.

6. (Withdrawn): A method of manufacturing artificial leather comprising the steps of:
forming an adhesive layer by coating said aqueous dry laminate adhesive composition according to claim 1 on a skin layer of the artificial leather formed beforehand on the release paper;
and

bonding said adhesive layer with a base fabric material of a artificial leather by a dry laminate process.

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7. (Withdrawn): Artificial leather products which are obtained by the manufacturing method according to claim 6.